New Patent Claims:

1. Electric motor, preferably of the three-phase type, whereby a first electric motor (10) is provided, which is mechanically connected via the rotor (5) thereof to a rotating shaft of an engine, especially of an internal combustion engine, and in addition at least one second electric motor (11) is provided, which is mechanically coupled via the rotor (6) thereof to a rotating part of a mechanical aggregate, characterized by the fact that the first electric motor (10) is electrically coupled via electronic power elements to at least the second electric motor (11) in order to exchange electric power at a freely selectable voltage level.

2. Electric motor in accordance with Claim 1, characterized by the fact that the second electric motor (11) is mechanically connected via the rotor (6) thereof to the rotating part of a turbo engine.

3. Electric motor in accordance with Claim 1 or 2, characterized by the fact that the first electric motor (10) is mechanically connected via the rotor (5) thereof to a rotating shaft or to the shaft of a combustion engine mechanically connected to the rotating shaft.

4. Electric motor in accordance with Claim 1 or 2, characterized by the fact that the electric motor (10) is mechanically connected via a gearbox to the combustion engine.

5. Electric motor in accordance with Claim 1 or 2, characterized by the fact that the first electric motor (10) is a part of the combustion engine, e.g. that the rotor (5) of the first electric motor (10) is integrated in the flywheel of the combustion engine.

6. Electric motor in accordance with at least one of Claims 1 to 5, characterized by the fact that the first electric motor (10) is connected to at least one external electric circuit, preferably a machine's mains (14).

7. Electric machine in accordance with at least one of Claims 1 to 6, characterized by the fact that the first (10) and second electric motor (11) are mounted in a casing (9).

8. Electric motor in accordance with at least one of Claims 1 to 7, characterized by the fact that the first (10) and/or the second electric motor (11) are designed as an asynchronous, synchronous or reluctance motor.

9. Electric motor in accordance with at least one of Claims 1 to 8, characterized by the fact that the first (10) and second electric motor (11) have rotors (5, 6) with the same axis of rotation.

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10. Electric motor in accordance with at least one of Claims 1 to 9, characterized by the fact that one of the two motors (10, 11) is designed as an inner rotor and the other motor is designed as an outer rotor.

11. Electric motor in accordance with at least one of Claims 1 to 10, characterized by the fact that the two electric motors (10, 11) have a mutual stator plate package.

12. Electric motor in accordance with at least one of Claims 1 to 11, characterized by the fact that the components for electric power exchange between the electric motors (10, 11) and/or an external electric circuit (14) are mounted in a casing (9) with at least one electric motor (10, 11).

13. Electric motor in accordance with at least one of Claims 1 to 12, characterized by the fact that the casing (9) of at least one electric motor (10, 11) has a liquid cooling system.

14. Electric motor in accordance with at least one of Claims 1 to 13, characterized by the fact that a mains connection with direct current, alternating current or three-phase current can be derived from the electric circuit connecting the two electric motors.

15. Electric motor in accordance with at least one of Claims 1 to 14, characterized by the fact that the stator (1, 4) of at least one electric motor (10, 11) has at least two winding systems (22, 23), preferably galvanically separated in the motor (10, 11), that are coupled magnetically with the main flux of the motor (10, 11).

16. Electric motor in accordance with at least one of Claims 1 to 15, characterized by the fact that the at least two winding systems (22, 23) are connected via separate electronic power circuits (24, 25) with the relevant, preferably galvanically separated power circuits.

17. Electric motor in accordance with at least one of Claims 1 to 16, characterized by the fact that at least one winding system (22, 23) is connected via a rectifier bridge to a direct current or battery-fed mains, preferably a machine's mains (26) for power exchange in one direction.

18. Electric motor in accordance with at least one of Claims 1 to 17, characterized by the fact that at least one winding system (22, 23) is connected via a transistor bridge to a direct current or battery-fed mains, preferably a machine's mains (26) for power exchange in both directions.

19. Electric motor in accordance with at least one of Claims 1 to 18, characterized by the fact that with at least one of the winding systems (22, 23) the motor can be operated as a generator for charging the connected machine's mains (26) and as a motor, preferably as the starter for a mechanically coupled combustion engine.

20. Electric motor in accordance with at least one of Claims 1 to 19, characterized by the fact that via the at least two winding systems (22, 23), a galvanically separable electric power exchange between the circuits connected to the winding systems (22, 23) is possible.

21. Electric motor in accordance with at least one of Claims 1 to 20, characterized by the fact that the winding systems (22, 23) controlled via the electronically controlled switches take over the control of the electric parameters from winding systems coupled via non-controllable electronic power elements, preferably diodes.

22. Electric motor in accordance with at least one of Claims 1 to 21, characterized by the fact that each winding system (22, 23) is connected, galvanically independent of the other winding system (22, 23), with electromechanical function groups on generally different voltage levels.

23. Electric motor in accordance with at least one of Claims 1 to 22, characterized by the fact that an electromagnetic power exchange between the winding systems (22, 23) independent of rotor rotation according to the transformer principle is possible through close magnetic coupling of the winding systems (22, 23).

24. Electric motor in accordance with at least one of Claims 1 to 23, characterized by the fact that a slight electromagnetic influence on the winding systems (22, 23) results from weak magnetic coupling of the winding systems (22, 23).

25. Electric motor in accordance with at least one of Claims 1 to 24, characterized by the fact that a freely selectable electromagnetic power exchange between the winding systems (22, 23) and the rotor shaft can be achieved by controlling the electromagnetic parameters, preferably the currents and flux linking, of at least one winding system (22, 23).

26. Electric motor in accordance with at least one of Claims 1 to 25, characterized by the fact that the first and second electric motor (10, 11) are mounted in a casing.

27. Electric motor in accordance with at least one of Claims 1 to 26, characterized by the fact that the first and/or the second electric motor (10, 11) are designed as an asynchronous, synchronous or reluctance motor.

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28. Electric motor in accordance with at least one of Claims 1 to 27, characterized by the fact that the first and second electric motor (10, 11) have rotors with the same axis of rotation.

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